4:Grajdanzev--97 S-4 (no date) 1942 Formosans
116, 257, 377, 433, 473

"Our analysis has shown that in Taiwan only the electric power, chemical, and food industries are large-scale, and that among them the electric power and sugar industries tower far above the rest—in these the corporations would be huge even by the standards of industrially developed nations. We saw that in agriculture Taiwan is an island of contrasts—huge landholdings and poor 'independent' landowners and tenants. The same picture appears in industry and will become clearer on examination of some individual industries for which data are available. We saw that in Taiwan one should distinguish between the progress and prosperity of agriculture in general and of the agriculture of the small Chinese farmers. The same phenomenon appears in industry."

4:Grajdanzev--106 S-4 (no date) 1942 Formosans
116, 377, 473

"In February 1939 a large new station producing electricity from coal was put into action. There are now 158 private producers of electricity and 15 government stations on the island, but by far the most important producer is the Taiwan Denryoku Corporation, established in 1919, the capacity of whose stations is now 220,050 kw. Its paid-up capital is ¥45.8 million, its reserves, ¥15.1 million, and its debentures, ¥76.6 million. Its principal shareholders are the Taiwan government-general and Japan Life Insurance Company. Profits in the last few years have been seventeen per cent and it has paid seven per cent to its shareholders. The low rate of profits compared with other corporations is presumably to be explained by the fact that the company sells electricity to the armament plants, for example to the Nippon Aluminum Company, at a special reduced price of 0.5 sen per kwh. The same policy is pursued by Taiwan Denka Corporation, which sells electric current to a ferrosilicon plant at 0.6 sen per kwh. Another important company in this field is the Taiwan Dento Corporation, established in 1919, with paid-up capital of three million yen. It supplies electricity chiefly for domestic lighting and the capacity of its plant is 7,224 kw. Its rate of profit is about thirty per cent and it pays dividends of ten per cent (1).

1. Recent information from Taiwan (August 1940) tells of the merger of these companies, so that a huge monopolistic corporation will take their place."

C. Salt

317 433 Salt, available in quantity, is not produced from rock salt but by the evaporation of sea water on the western seaboard. The fields are centered around the towns of Anping, Putai, and Peimen. About 5,000 hectares of land were used as salt fields in 1954; production amounted to 369,000 metric tons. Domestic markets require approximately 75,000 metric tons a year, thus leaving a sizable amount of salt for export.

III. ELECTRICITY

376 Formosa has a number of short, swift-flowing rivers which are estimated to possess a total gross hydroelectric potential of some 3,300,000 kilowatts. According to a report made by the Taiwan Power Company, approximately 12 per cent (378,000 kilowatts) of the gross potential had been developed as of 1955. Formosa's 377 375 estimated thermoelectric generating capacity is 142,550 kilowatts, giving the island, as of 1955, approximately a total generating capacity of 520,550 kilowatts. The peak load in that year is estimated to have been 360,000 kilowatts.

377 Only the Taiwan Power Company produces electric power for general distribution. Some government and private enterprises generate power for their own consumption; notable among these enterprises are the Taiwan Sugar Corporation, the Taiwan Pulp and Paper Corporation, the Taiwan Cement Corporation, and the Taiwan

377 Aluminum Corpoation, having a capacity of 71,300 kilowatts. The Taiwan Power Company has 35 generating stations -- 24 hydroelectric stations, with a capacity of 330,400 kilowatts; 4 thermoelectric stations, with a capacity of 59,500 kilowatts; and 6 small diesel generators, with a capacity of 2,050 kilowatts. All but two of the hydroelectric plants are without storage reservoirs and are dependent upon river-flow. The two hydroelectric plants at Sun-Moon Lake (Jitsugetsutan) have a storage reservoir, but production is sometimes curtailed, as when the reservoir was nearly emptied during a drought in the winter of 1950. The Jitsugetsutan system also includes a plant at Wan-ta, and accounts for over one-third of the total generating capacity on Formosa.

376 In order to meet the demands for additional
377 light and power, power-generating plants have been expanded to serve industry and private needs. Power generation and power consumption are shown in the tables below.

45Stanford U. S-4, 5 1956 AD 1 Formosa
AD1
AD1

375
377

POWER GENERATION */
(in million kilowatt-hours)

Year	Hydro	Thermal	Total
1950	978	66	1,044
1951	1,169	123	1,292
1952	1,203	179	1, 382
1953	1,467	97	1, 564
1954	1,565	240	1,805

POWER CONSUMPTION */
(in million kilowatt-hours)

Year	Industrial	Non-industrial	Total
1950	459	258	717
1951	698	258	956
1952	817	260	1,077
1953	923	301	1,224
1954	1, 077	326	1,403

*/ Taiwan Economic Data Book, Vol. 3, 1955.

375 Thermal power generation serves in an auxiliary
377 capacity; hydroelectric plants furnish the bulk of power required. Industrial consumption has increased rapidly in recent years; non-industrial use has remained relatively stable. This may accounted for, in part, by the rapid expansion of the textile and chemical industries and, to a lesser extent, the increased production of metal, machinery, and food processing industries. Hydroelectric power is also available for irrigation. In 1954, the textile and chemical industries accounted for over 34 per cent of the total consumption of power on Formosa; in 1950, these industries required only a little more than 22 per cent. The gradual increase in the non-industrial consumption of power has been the result of the electrication of some rural areas.

In 1942, the Japanese then in control of the island made plans to link the two existing power generating systems. Surveys were completed, but the demands of war made necessary the postponement of the plan to channel power from the eastern system to the western system, where power was in greater demand. The two systems were linked in 1951 with the completion of a trans-island power transmission line.

In 1952, the Taiwan Power Company established a five-year plan for the expansion of power plants. It was contemplated that by 1957 an additional 302,850 kilowatts (a total of 633,850 kilowatts) would be available to meet

375 the increased needs of economy. Some seven
377 hydro stations and four thermal stations were to be built or expanded by 1957. By the end of 1954, four stations had been expanded, providing an additional 58,750 kilowatts. Listed below are those stations known to be under construction, together with their potential capacity.

ELECTRIC POWER PROJECTS */

	Potential Capacity	Scheduled for Completion
Pei-pu Steam St ation	40,000 Kw.	1955
T'ung-men Hydro Station	21,000	1955
Kaohsiung Steam Station	40,000	1955
T'ien-leng Hydro, 2nd Extension	26,500	1956
Kaohsiung Steam, 2nd Extension	40,000	1956
Wu-she Hydro Station	20,000	1957
Nan-shih Hydro Station	20,000	1957
Chu-k'eng Hydro Station	100,000	1957
Lung-chien Hydro Station	40,000	1957
Shih-men Hydro Station	120,000	1960
Total	467,500	

*/ Mutual Security Mission to China, Economic Development on Formosa: 1951-52, Taipei, 1953, p. 25; China News Press, China Annual 1953, Taipei, 1954, Vol. 2, pp. 68-69. China Annual 1954, Vol. 3, p. 54.

379 Formosa has not yet exploited the hydroelectric potential offered by its heavy annual rainfall and the steepness of its river gradients, and no sustained effort has been made to compensate for the varying water reserves available at different times of year, headwater erosion, the narrow valleys in which the rivers flow, and the silt and gravel which combined to reduce the efficiency of the streams as a source of power. For these reasons, the economic development of potential power sites is as important to Formosa as the implementation of flood control and irrigation programs.

Currently, the Taiwan Power Company has established a committee to investigate and plan the generation of power by atomic energy on Formosa.

IV. FOOD PROCESSING INDUSTRIES

A. The Production of Sugar

249 The history of the sugar industry in Formosa
433 goes back to 1349, when islanders "boiled sea
431 water to make salt and fermented molasses to produce liquor." [17] In 1650, when the Dutch were occupying Formosa, some 6,000 metric tons of sugar cane were produced each year. Of this amount, two-thirds were exported to Japan and marketed in lands as far away as Persia. Under the rule of Cheng Ch'eng-kung (Koxinga), who

17. China News Press, T'ai-wan Ching-chi Nien-pao, 1953 [Annual of Taiwan's Economy, 1953], Taipei, 1953, p. 45.

52:Barclay S-5 (nodate)1954 AD1 Formosa AD1

supply of unoccupied land in Taiwan that could be drawn into cultivation, and so the needs of an expanding farming population and growing export demand had to be met by other means. The Japanese turned again to large investment to improve the effectiveness of the land that there was. The manner of constructing and upkeep of irrigation canals in Taiwan depended on mass labor. They were turned into an investment of labor, employed so as to produce an important form of capital equipment. The extent of irrigation more than kept pace with rural population growth while the Japanese were in control. Water for this purpose became indispensable in maintaining the output of farms. It was a hidden element in the improvement of rice and sugar yields, for the new varieties of seed that were developed were types that needed to be carefully irrigated.

Finally, the development of electric power was so closely related to the growth of Taiwan's newer industries that it should not be passed over without mention. Generation of electricity was one of the specialized heavy investments that formed the nucleus of the "industrial" progress after 1930. This is evident in a circumstantial way from the trends of capacity in generating power and the spread of factory employment (see Fig. 8). Factories in Taiwan came to depend on the cheap electricity that was developed at state instigation from water power. Judged from the size of their employment, the most important of the mechanized factories in the island were "food" (i.e., sugar) and metallurgical plants, which were the heaviest users of electricity.

As the next chapter will indicate, the Japanese broadened their objectives in Taiwan too late to put its human resources to best use in the new effort. Drawing the developed wealth of the island together into centralized control had turned out to be singularly advantageous. It had erected an entire structure of corporate organization from specialized financial services down to the coordinating of actual physical production of commodities. The Government-General had retained a close supervision over this structure, by licensing, regulation, and participation as a shareholder. As a program it quickly marshalled the production of Taiwan's farms into a profitable colonial enterprise.

When it came to pressing this development further, however, the Japanese made no real progress, for they had frustrated these aims in advance. Under agrarian conditions, industrial skills and experience in management are slower and more difficult to accumulate

"ECONOMIC DEVELOPMENT" IN TAIWAN

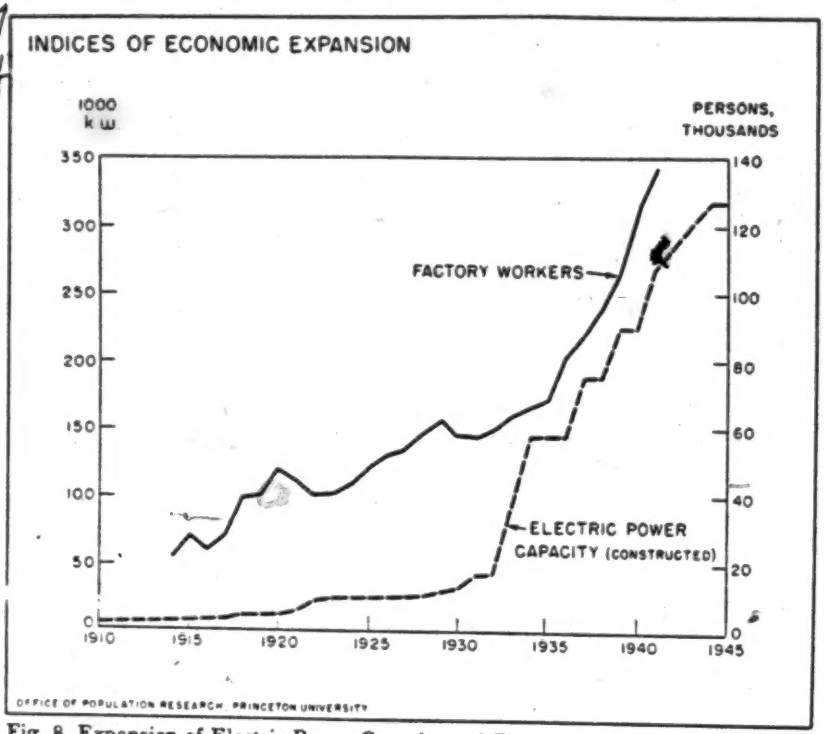

Fig. 8. Expansion of Electric Power Capacity and Factory Employment in Taiwan, 1910-1945.

than material forms of capital. Japanese in the past had never cultivated an adequate fund of these among the Taiwanese. The same mechanisms which had served so well in channeling a large part of the total product each year toward desired uses had suppressed any opportunities for industrial employment that might attract Taiwanese who had administrative skills. What the Japanese themselves referred to as the "industrialization of Taiwan" was nothing but a corporate superstructure placed on an agrarian base. This was not capable of diffusing an industrial culture thoroughly among the general population, because it had been devised to prevent this very thing.

C F 423 427

tenants there has been a rent reform program, which went into effect in 1949 and set a maximum rental ceiling of 37.5 percent of the total yield (average rental had theretofore ranged from 46 to 62.5 percent of the total yield). The income of tenant farmers has, in consequence of the program, risen by an average of 30 percent. The reform legislation provides that where the main crop yields are less than 20 percent of normal the tenant shall not be required to pay any rent at all. It also gives the farmer security of tenure (landlords may no longer refuse to renew contracts in order to re-rent on more favorable terms), and it restricts landlords' right to dispossess tenants. By 1951, 97.54 percent of the tenant farmers had completed new contracts under the new law, and the landlord problem had been brought, for the most part, under control. The price of land has steadily declined, which, of course, enables more and more tenant farmers to buy land to own. The rent reduction program has been carried out in cooperation with a Chinese-American organization, the Joint Commission on Rural Reconstruction, which is responsible for a program of general agricultural improvement: the construction of irrigation dams and canals, reclamation projects, the making available of better seeds and fertilizers, animal disease control, the organization of farmer associations and rural cooperatives, and rural health measures.

C F 241 654

By the end of the period 1950–1951, the use of US-financed fertilizer had brought rice production to the highest peak in the history of Taiwan. In exchange for much-needed foreign currency, twenty-two thousand, five hundred eighty-seven metric tons of Taiwan's surplus were exported to Japan and South Korea. Other foods basic to local consumption were also above peak prewar production levels. Sweet potatoes were up 20 percent, wheat 165 percent, and peanuts 89 percent. Considering the handicaps under which the government started, the economy of Taiwan is now surprisingly stable, largely because of the increased agricultural productivity reflected in the foregoing statistics.

C F 652

Economic Reform

In 1949, to meet the economic crisis precipitated by the soaring inflation of the Chinese National currency, to which the Taiwan dollar was then linked, a fresh start was made by introducing a new currency, linked to the US dollar and backed by gold bullion brought over from the mainland. At the same time, a series of deflationary measures were enlisted. The government's expenditures, for example, were curtailed by reducing its personnel and cutting back certain of its activities; at the same time, its resources were increased by means of a new luxury tax (based upon ownership of property, including cars and refrigerators), a defense tax, the floating of bonds, and the sale of government assets. The program, as a whole, had the effect of encouraging private enterprise, so that the usual sources of revenue (customs receipts, returns from the salt monopoly, the postal services, and assorted government enterprises in fields like telecommunication, air transport, navigation, petroleum, aluminum, gold, coal, copper, and steel) became more productive.

C F [377] [249] 433

Industrial Recovery

In industry, Taiwan's return to prosperity has been extremely rapid. At the time of Japan's surrender, the annual coal production had dropped to 776,000 metric tons (as compared to peak production of 1,182,635 in 1941); electric power had fallen off to 52,646 KW (as compared to the peak load of 152,355 KW in 1943); the production of sugar (the chief product for export) had declined to 86,073 metric tons (as compared to 1,418,000 metric tons before WW II), that of cement to 78,000 metric tons (as compared to peak production

36: Rowe S-4 (no date) 1955 AF1 China AF1
Formosa AD1

of 303,400 metric tons) and that of industrial salt to 67,000 metric tons (as compared to peak production of 465,000 metric tons). The production of chemical fertilizer (33,800 metric tons before the war) had come to a halt. Tea processing plants and pineapple packing plants stood deserted. In short, by V-J Day the ravages of war, materials shortages, and lack of maintenance had almost paralyzed the industry of Taiwan. The railroads had worn out no less than 1400 steel bridges which had to be classified as unsafe to use.

After V-J Day, rehabilitation work on the railroads was given a high priority. Eroded steel bridge spans were removed, worn-out sleepers and rails were replaced, road beds were reconditioned. Today, passenger traffic exceeds the peak load of the prewar period; freight traffic, after tripling itself in one year, is approaching prewar peak.

Rehabilitation of the power system made great demands on the ingenuity of the available Chinese engineers. Little foreign exchange was available with which to buy needed replacements, so that the repairs had to be accomplished by reworking obsolete and broken equipment scattered about over the island. Through tedious patching and repairing operations, and the acquisition of a few spare parts that could not be improved, they tripled generating capacity in two years. By 1951, capacity had reached an all time high of 217,000 KW. Today coal (1,451,000 metric tons in 1952), cement (389,000 tons in 1951), chemical fertilizers (more than three times prewar production), petroleum, cotton yarn (three times Japanese peak production) and cotton piece goods (four times Japanese peak production) have all surpassed prewar production figures.

The sugar industry, which, as in the past, is Taiwan's most important source of foreign exchange, has done less well by comparison with prewar standards, but not, or at least not primarily, because rehabilitation operations failed to be carried out. In 1945, 27 of 36 plants stood seriously damaged. By 1948, all the factories and plantation railways had been completely rehabilitated, and by 1950 sugar production had climbed back to 630,000 metric tons. The Taiwan Sugar Corporation's capacity is now over one million tons a year. In 1949–50, however, sugar dropped in price on the world market, and farmers turned from sugar to rice. In 1951–52, the world market price began to rise, and sugar production is gradually returning to its previous high levels.

Paper and pulp mills, machinery shops, shipbuilding, and aluminum works have, likewise, been gradually restored. Another worthwhile project has been the development of a fishery industry which has improved the Taiwanese diet (including that of the Nationalist Army) without great expenditures. American economic aid has played an important role in the rehabilitation and development of all these industries.

A labor insurance policy was put into effect on 1 March 1950. Its object is described as "safeguarding the livelihood of the workers and promoting harmonious relations between labor and management so as to ensure social security and high production." According to the Labor Insurance Regulations, all workers employed in public and private factories, mines, salt fields, communications, and public utilities in Taiwan shall be insured. It is compulsory labor insurance on a limited scale. The benefits are insurance against injury, death, maternity, disability, and old age. It also has provision for free medical clinics. This new system of social insurance was put into effect with the cooperation of the Chinese Federation of Labor, the Free China Labor League, and the Provincial General Labor Union. Their delegates also sit as members of the legislature of the provincial government.

The government has also carried out a tax reform and overhauled the tax collection system. The reform program went into effect on 1 January 1951. The number of distinct taxes was reduced from 20 to 11, leaving the income, inheritance, stamp, commodity, land, business, slaughter-house, entertainment and amusement, vehicle license, and household taxes.